



**SGS-CSTC Standards
Technical Services
(Shanghai) Co., Ltd.**

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Report No.:SHEM110100005301
Page 1 of 46

FCC Partial Test Report

Application No. : SHEM110100005301
Applicant: Sierra Wireless Inc.
Equipment Under Test (EUT):
Product Name: Wireless Modem
Brand Name: **Sierra Wireless**
Model Name: AR8550
Standards: FCC part 2, 22H & 24E & 27
Date of Receipt: Jan. 27, 2011
Date of Test: Jan. 27, 2011 to Mar. 4, 2011
Date of Issue: Mar. 4, 2011

| | |
|----------------------|---------------|
| Test Result : | PASS * |
|----------------------|---------------|

* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further details.

Tino Pan
E&E Section Manager
SGS-CSTC (Shanghai)Co., Ltd.

Jim Xu
Project Engineer
SGS-CSTC (Shanghai)Co., Ltd.

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2 Test Summary

| Description of Test | FCC Rules | Result |
|---|--|-----------|
| Out of Band Emissions at antenna Terminals and Band Edge | 2.1051 22.917(a) 24.238(a) 27.53(g) | Compliant |
| Field Strength of Spurious Emissions | 2.1053 22.917(a) 24.238(a) 27.53(g) | Compliant |



3 Contents

| | Page |
|--|----------|
| 1 COVER PAGE | 1 |
| 2 TEST SUMMARY | 2 |
| 3 CONTENTS | 3 |
| 4 GENERAL INFORMATION | 4 |
| 4.1 CLIENT INFORMATION | 4 |
| 4.2 GENERAL DESCRIPTION OF E.U.T. | 4 |
| 4.3 DETAILS OF SUPPORT UNITS | 4 |
| 4.4 TEST LOCATION | 4 |
| 4.5 TEST FACILITY | 5 |
| 4.6 TEST METHODOGY | 5 |
| 5 EQUIPMENTS USED DURING TEST..... | 6 |
| 6 TEST RESULTS | 8 |
| 6.1 E.U.T. TEST CONDITIONS..... | 8 |
| 6.2 OUT OF BAND EMISSIONS AT ANTENNA TERMINALS | 9 |
| 6.2.1 <i>Band edges emissions</i> | 9 |
| 6.3 FIELD STRENGTH OF RADIATED SPURIOUS EMISSIONS..... | 30 |



4 General Information

4.1 Client Information

Applicant: Sierra Wireless Inc.
Address of Applicant: 13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.
Manufacturer: Sierra Wireless Inc.
Address of Manufacturer: 13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.

4.2 General Description of E.U.T.

| | |
|-------------------------|---|
| Product Name: | Wireless Modem |
| Brand Name: | Sierra Wireless |
| Model Name: | AR8550 |
| Power Supply: | 4.0VDC |
| Support Frequency Band: | GSM 850/900/1800/1900, WCDMA Band II/IV/V |
| Test Frequency Bands: | GSM 850/1900, WCDMA Band II/IV/V |
| Hardware Version: | Version 1.0 |
| Software Version: | ARx550_FP.00.04.01.00 |
| IMEI: | 351926040007206 |

4.3 Details of support units

| Name / Function | Model No. | Remark |
|-----------------|----------------|--------|
| Laptop | ThinkPad X100e | N/A |
| DC power | N/A | 30V/2A |

4.4 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655



4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2011-07-29.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.

4.6 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA-603-C-2004 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.



5 Equipments Used during Test

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Due date |
|------|--------------------------------------|---------------------------------------|-----------------------------|------------|------------|---------------|
| 1 | Spectrum Analyzer | Rohde & Schwarz | FSP-30 | 100324 | 2010-4-19 | 2011-4-18 |
| 2 | EMI test receiver | Rohde & Schwarz | ESU40 | 100109 | 2010-6-3 | 2011-6-2 |
| 4 | Horn Antenna | Rohde & Schwarz | HF906 | 100284 | 2010-4-9 | 2011-4-8 |
| 5 | Horn Antenna | Rohde & Schwarz | HF906 | 100285 | 2010-10-9 | 2011-10-8 |
| 6 | ANTENNA | SCHWARZBECK | BBHA9120D | 9120D-679 | 2010-6-3 | 2011-6-2 |
| 7 | Ultra broadband antenna | Rohde & Schwarz | HL562 | 100227 | 2010-10-09 | 2011-10-08 |
| 8 | Atmosphere pressure meter | Shanghai ZhongXuan Electronic Co.,Ltd | BY-2003P | -- | 2010-10-15 | 2011-10-14 |
| 9 | CLAMP METER | FLUKE | 316 | 86080010 | 2010-04-28 | 2011-04-27 |
| 10 | Thermo-Hygrometer | ZHICHEN | ZC1-2 | 01050033 | 2010-10-21 | 2011-10-20 |
| 11 | Digital illuminance meter | TES electrical electronic Corp. | TES-1330A | 050602219 | 2010-10-16 | 2011-10-15 |
| 12 | TEMPERATURE& HUMIDITY BOX | KSON | THS-D2C-100 | K40723 | 2010-11-18 | 2011-11-17 |
| 13 | High-low temperature cabinet | Shanghai YuanZhen | GW2050 | -- | 2010-6-27 | 2011-6-26 |
| 14 | DC power | KIKUSUI | PMC35-3 | NF100260 | 2010-1-16 | 2011-1-15 |
| 15 | Power meter | Rohde & Schwarz | NRP | 101641 | 2010-5-4 | 2011-5-3 |
| 16 | UNIVERSAL RADIO COMMUNICATION TESTER | Rohde & Schwarz | CMU 200 | 112012 | 2010-08-25 | 2011-08-24 |
| 17 | Tunable Notch Filter | WRCT800.0/880.0-0.2/40-5SSK | Wainwright instruments GmbH | 9 | 2010-1-27 | 2011-1-26 |



**SGS-CSTC Standards
Technical Services
(Shanghai) Co., Ltd.**

ReportNo.: SHEM110100005301
Page: 7 of 46

| | | | | | | |
|----|----------------------|---------------------------------|-----------------------------|----|-----------|-----------|
| 18 | Tunable Notch Filter | WRCT1800.0/2000.0-0.2/40-5SSK | Wainwright instruments GmbH | 11 | 2010-1-27 | 2011-1-26 |
| 19 | Band Reject Filter | WRCG 824/849-814/859-40/8SS | Amiden,Ireland | 1 | 2010-1-27 | 2011-1-26 |
| 20 | Band Reject Filter | WRCG 1850/1910-1835/1925-40/8SS | Amiden,Ireland | 13 | 2010-1-27 | 2011-1-26 |

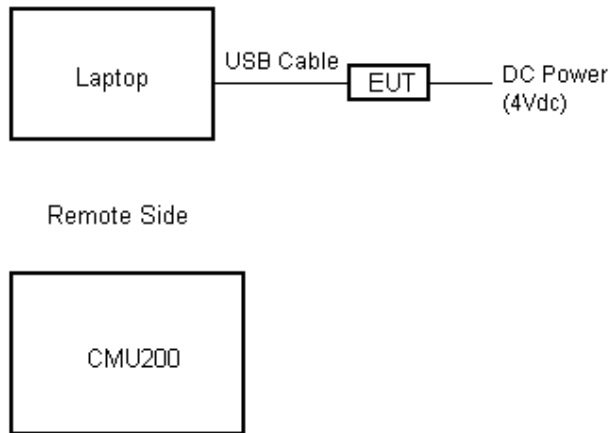
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6 Test Results

6.1 E.U.T. test conditions

Power supply: 4VDC

Operating Environment:
 Temperature: 20.0 -25.0 °C
 Humidity: 38-48 % RH
 Atmospheric Pressure: 992 -1006 mbar
 Configuration of
 Tested System:





6.2 Out of band emissions at antenna Terminals

6.2.1 Band edges emissions

Test Requirement: Part 2.1051,
FCC part 22.917(a), 24.238(a), 27.53(g) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specification in the instruction manual and/or alignment procedure, shall not be less than $43+10\log(\text{Mean power in watts})$ dBc below the mean power output outside a license's frequency block(-13dBm).

Test Date: Jan. 27, 2011 to Feb. 01, 2011

Test Procedure:

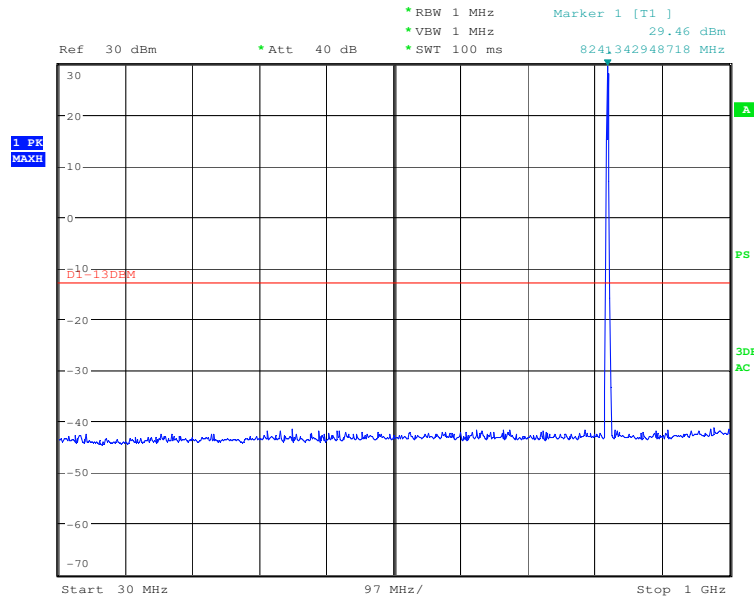
The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emission is any up to 10th harmonic.

For the out of band: set RBW, VBW=1MHz, start=30MHz, stop= 10th harmonic. Limit= -13dBm

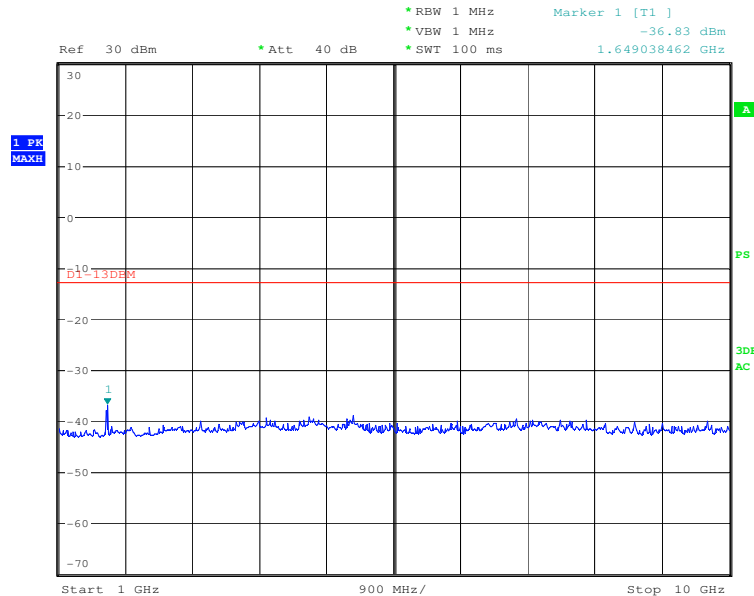
Band Edge requirements: In 1Mhz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 % of bandwidth of fundamental emission of the transmitter any be employed to measure the out of band emission. Limit= -13dBm.



Measurement result:
GSM 850 Channel Low



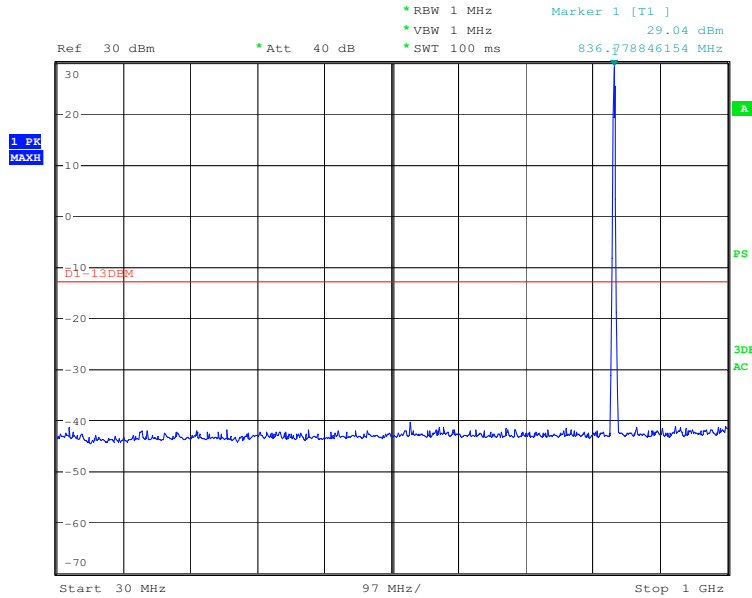
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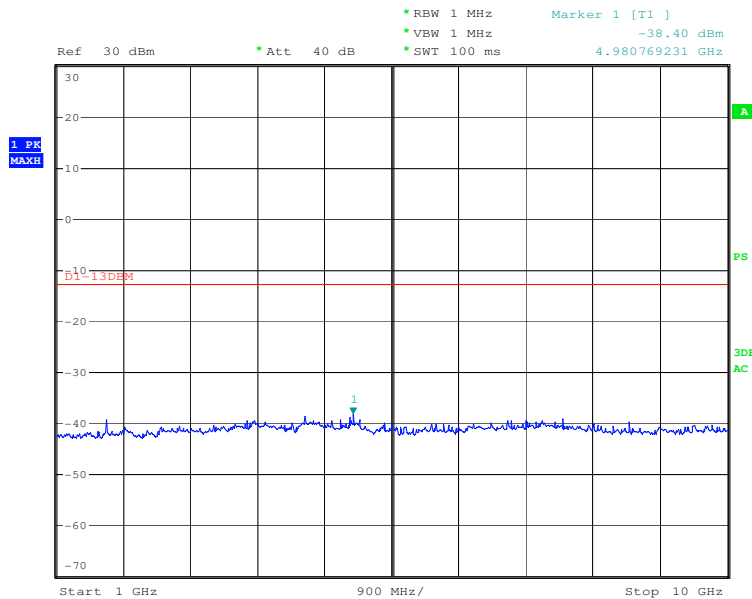
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GSM 850 Channel Mid



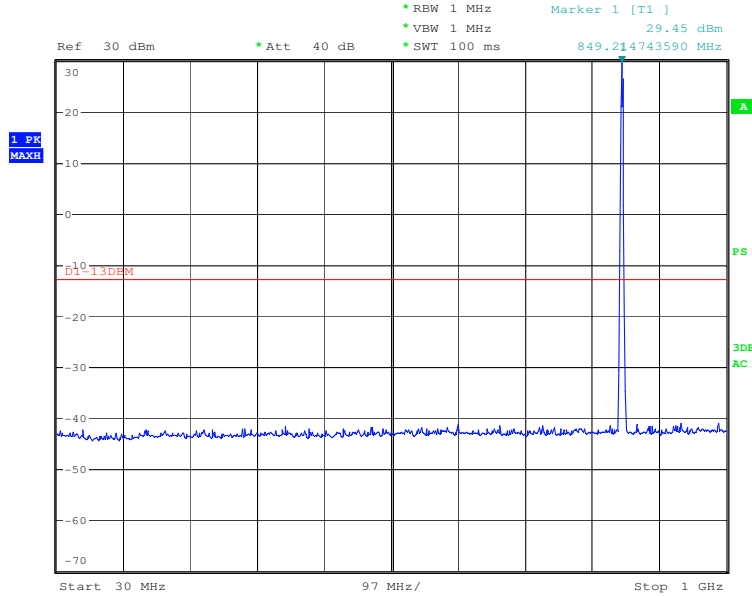
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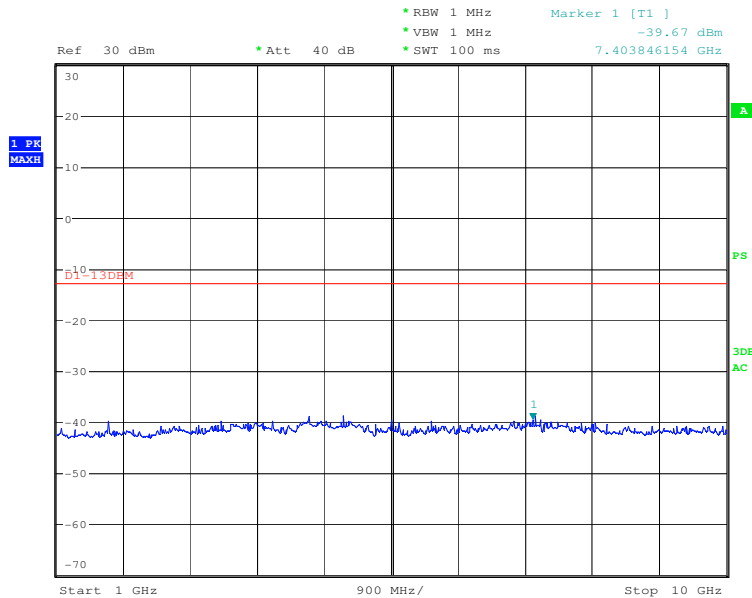
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GSM 850 Channel High



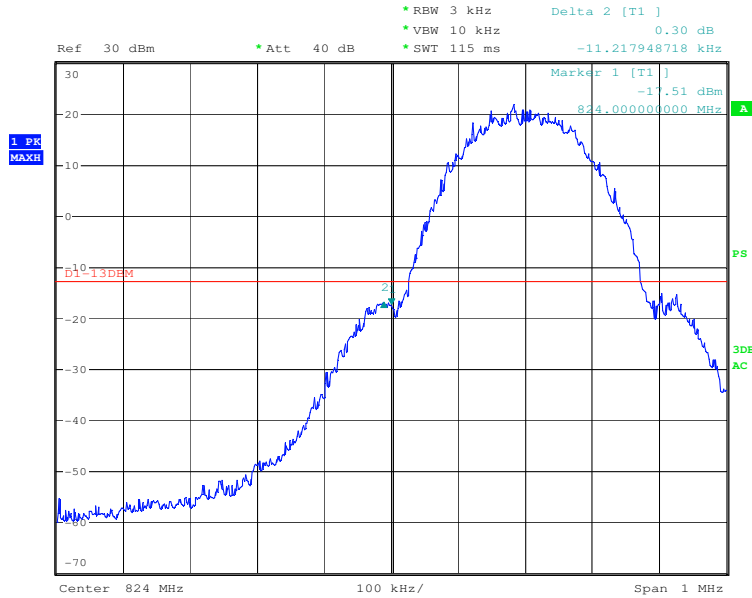
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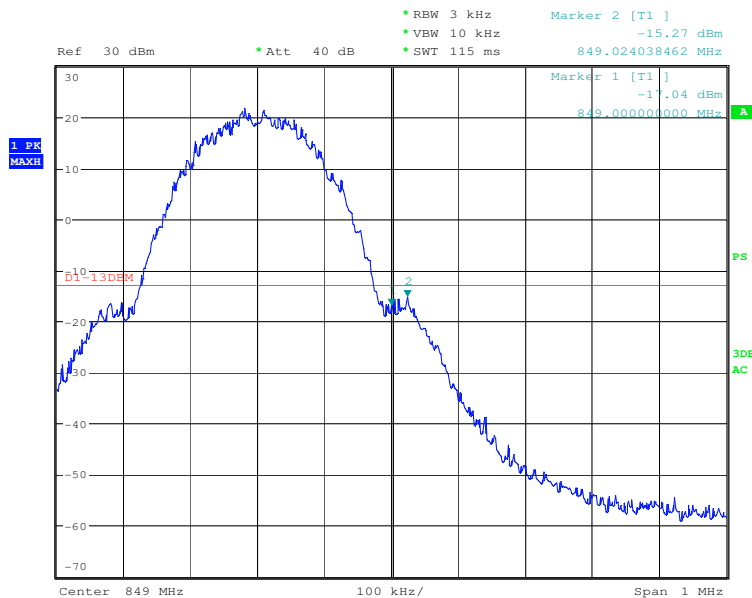


Band Edge emission GSM 850 Channel Low



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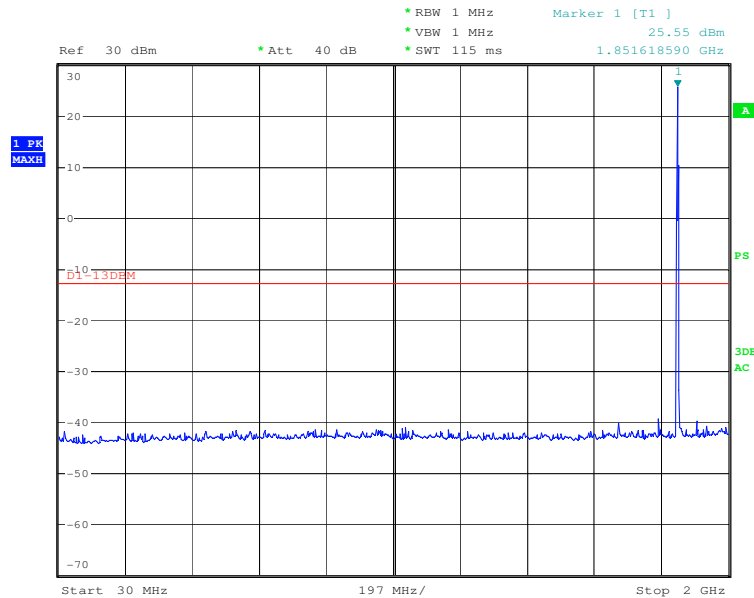
Band Edge emission GSM 850 Channel high



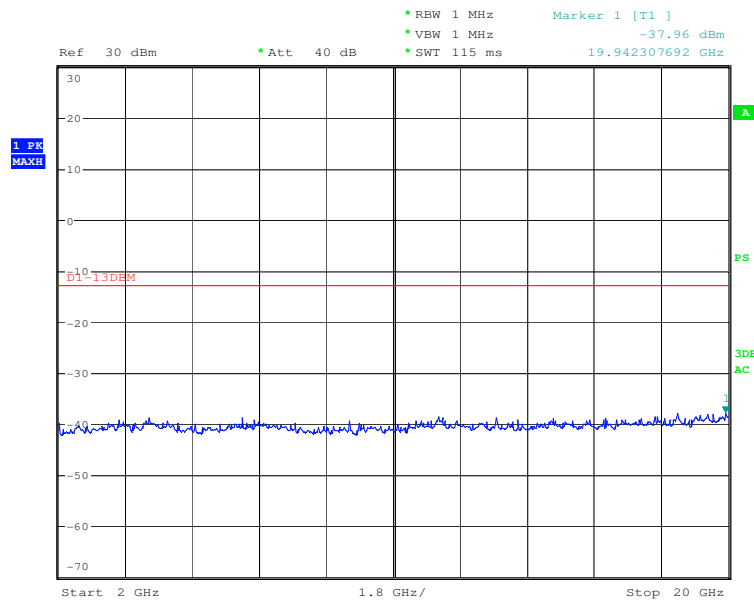
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PCS 1900 Channel Low



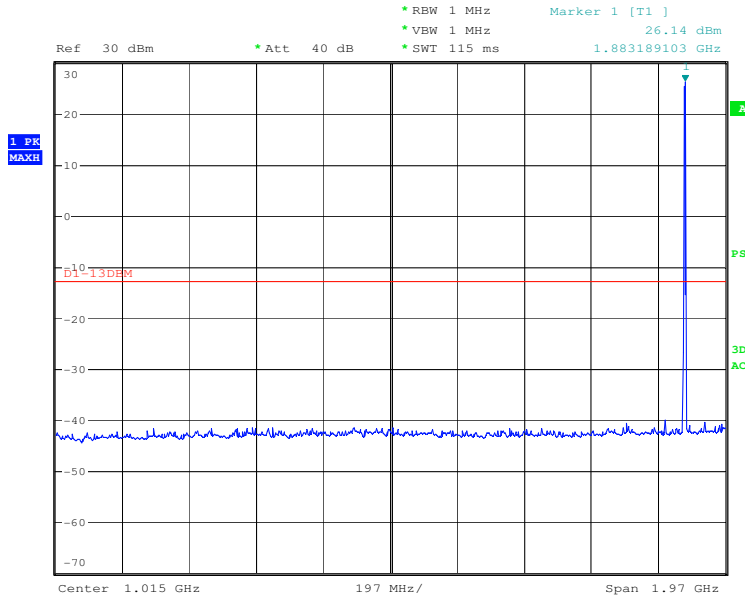
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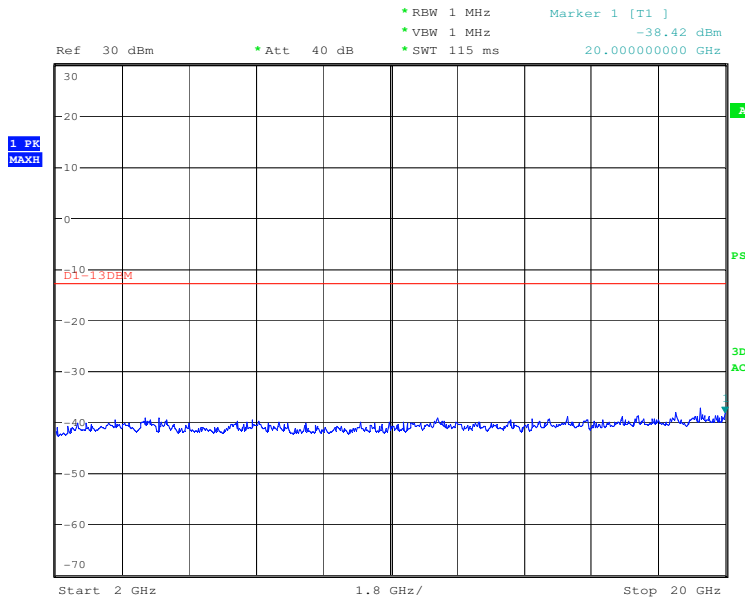
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PCS 1900 Channel Mid



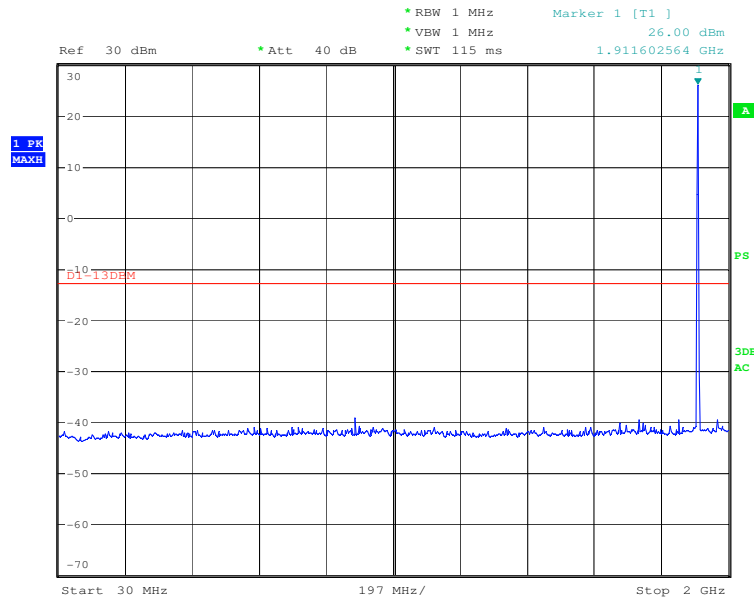
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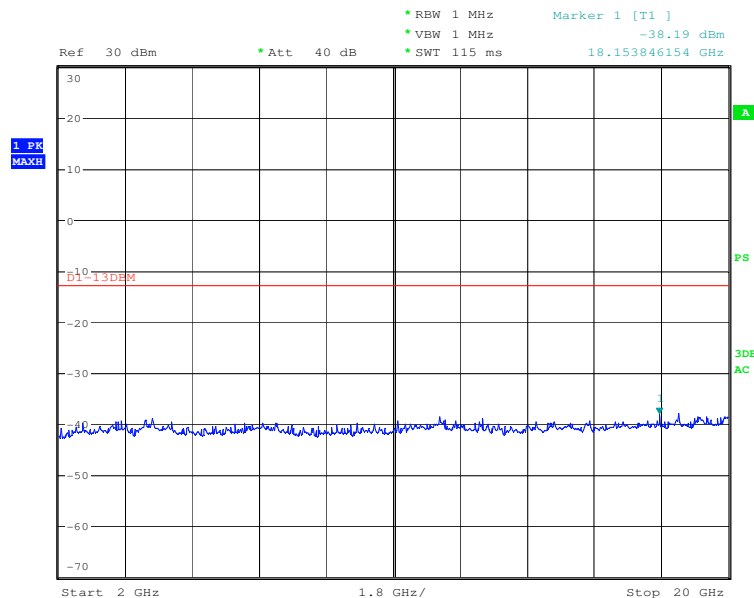
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PCS 1900 Channel High



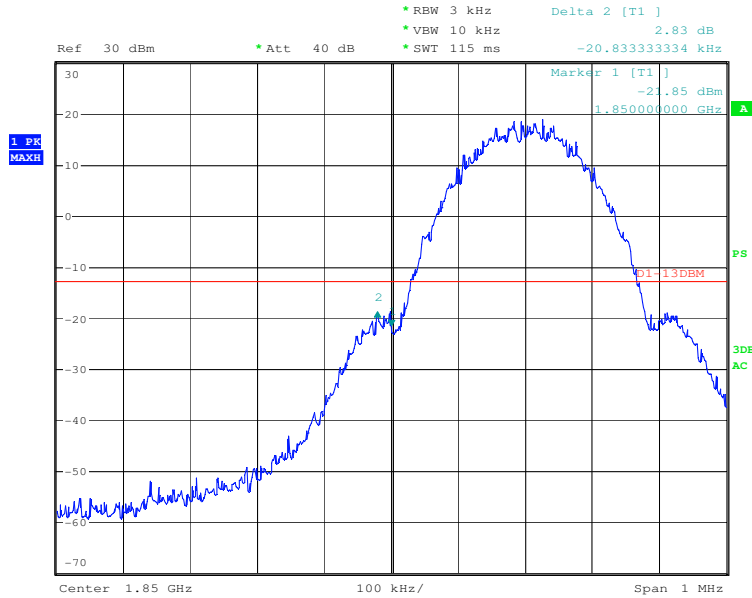
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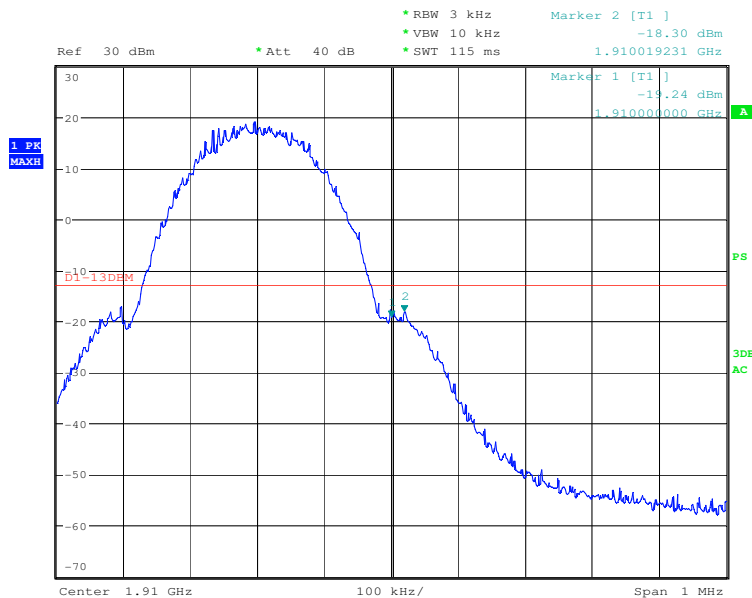


Band Edge emission PCS 1900 Channel Low



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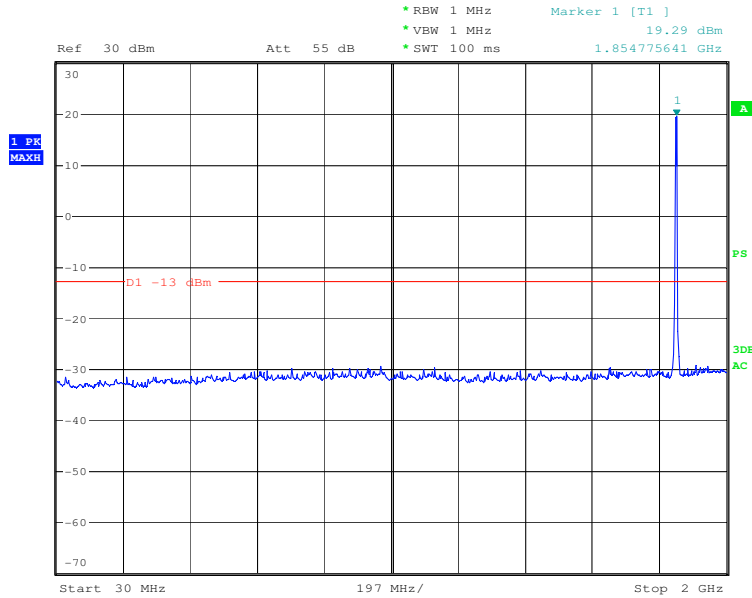
Band Edge emission PCS 1900 Channel high



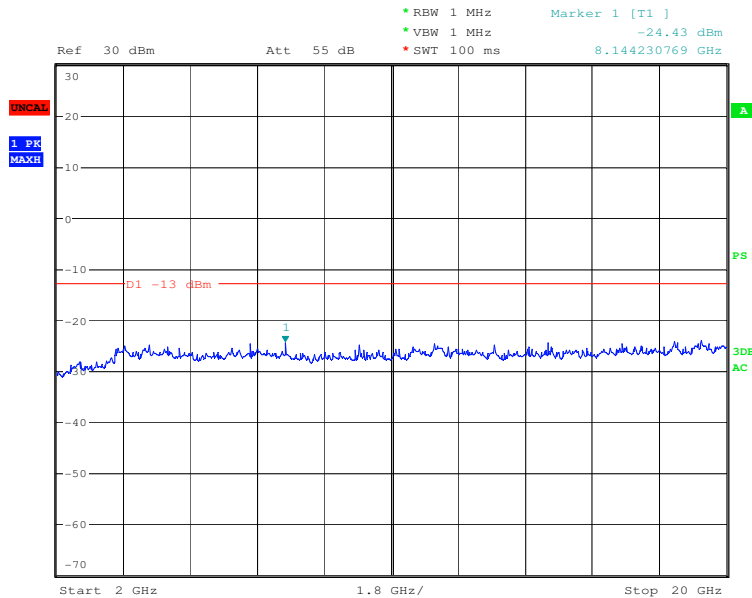
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WCDMA Band II Channel Low



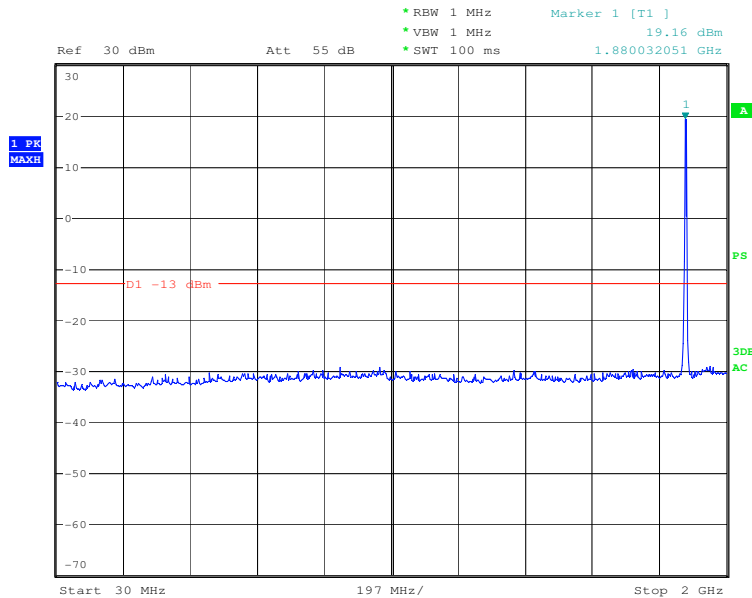
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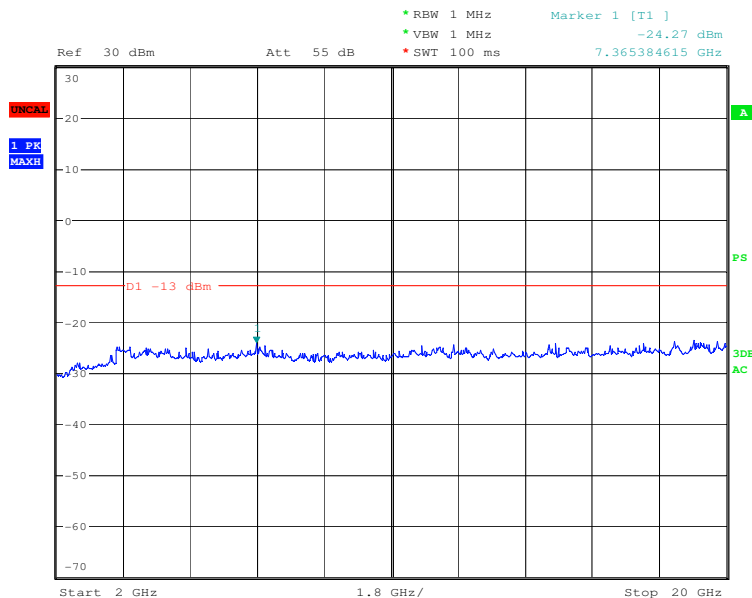
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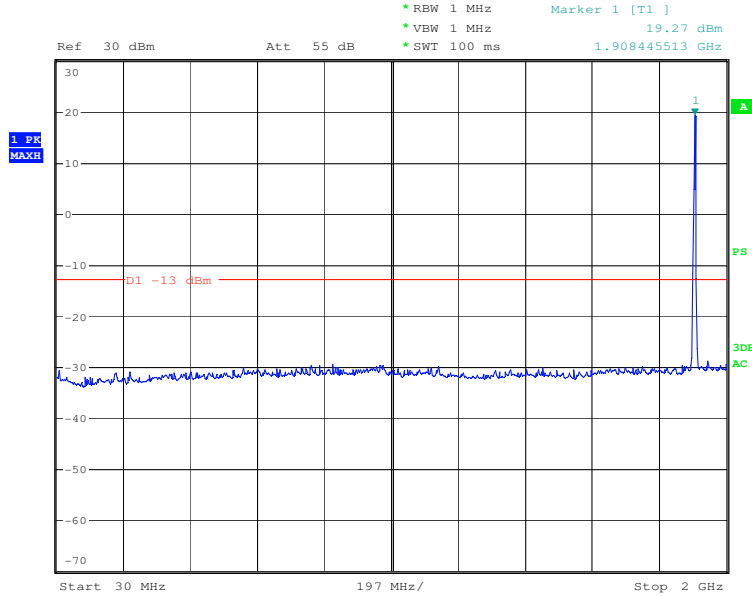
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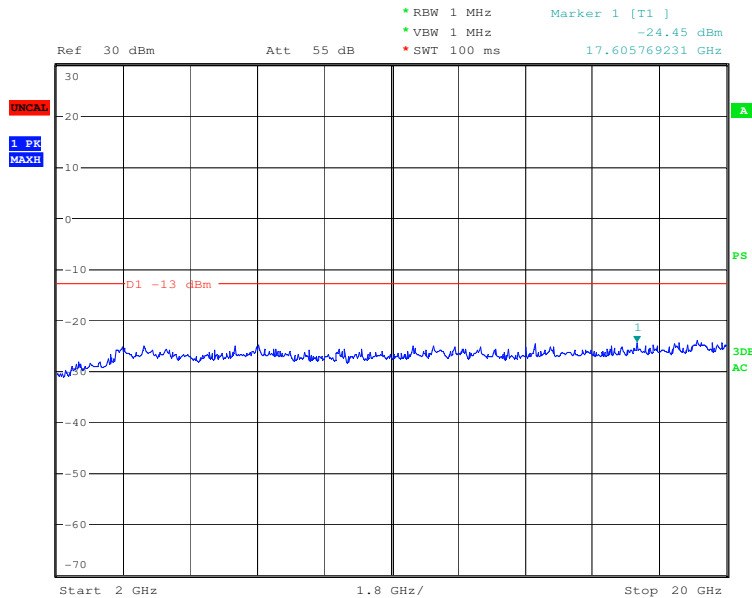
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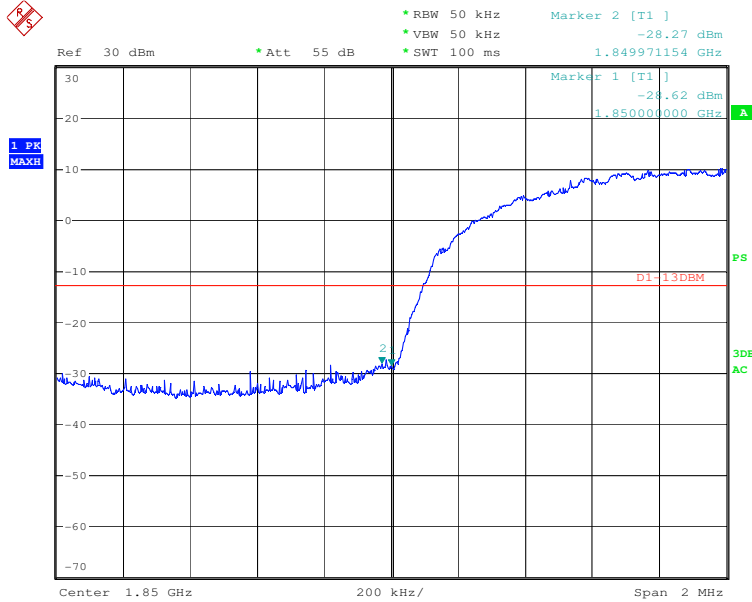
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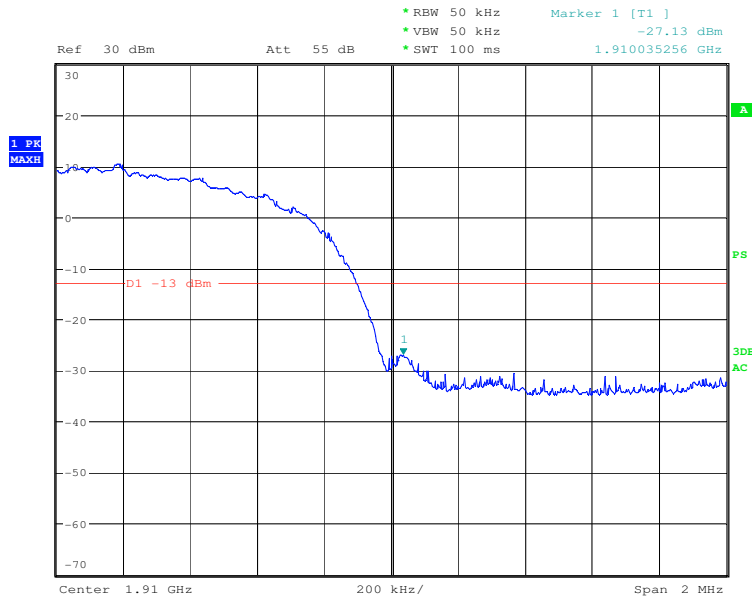


Band Edge emission WCDMA Band II Channel Low



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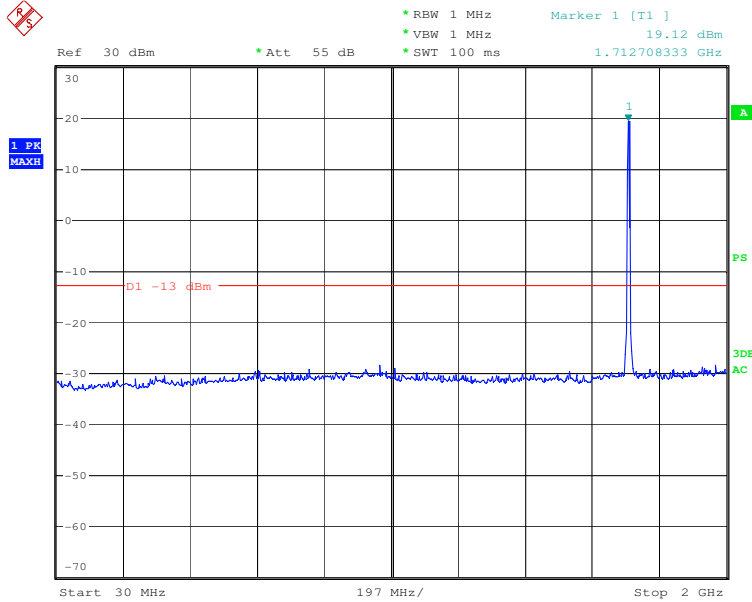
Band Edge emission WCDMA Band II Channel high



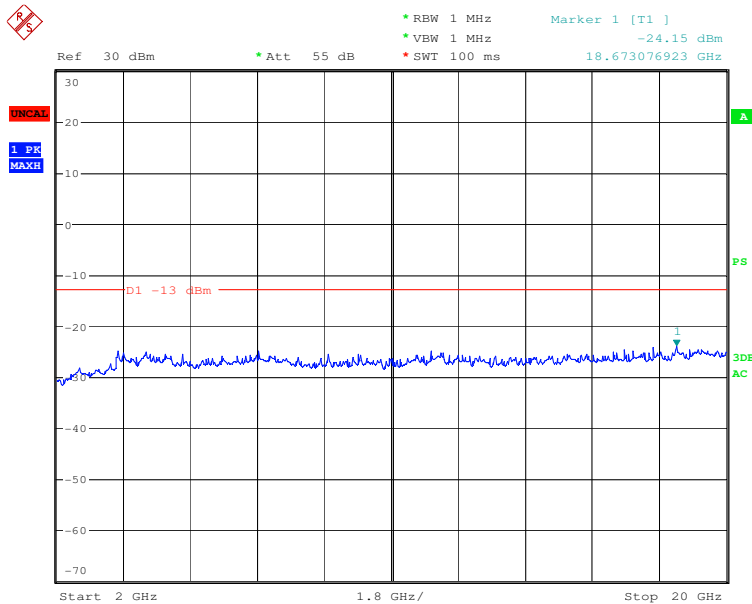
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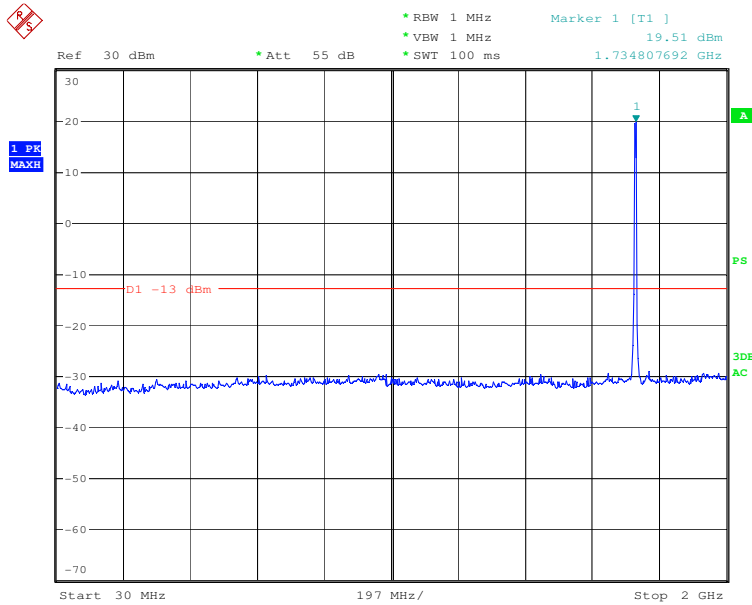
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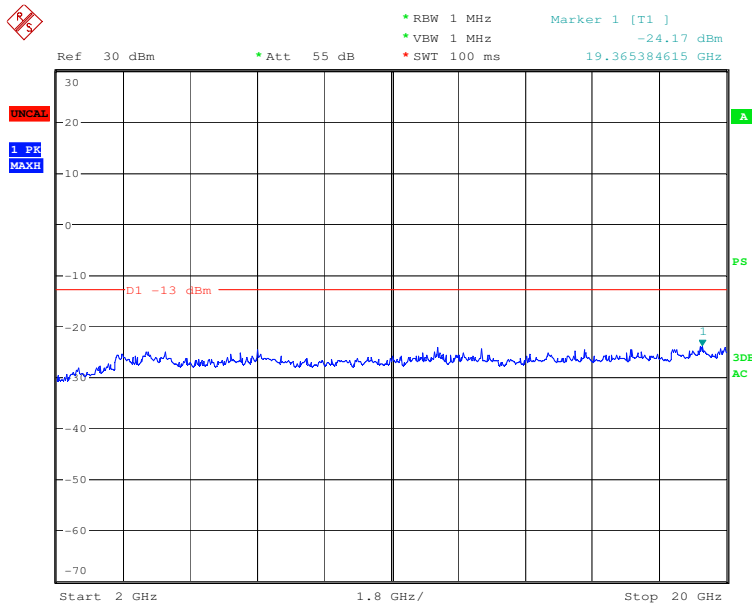
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WCDMA Band IV Channel Mid



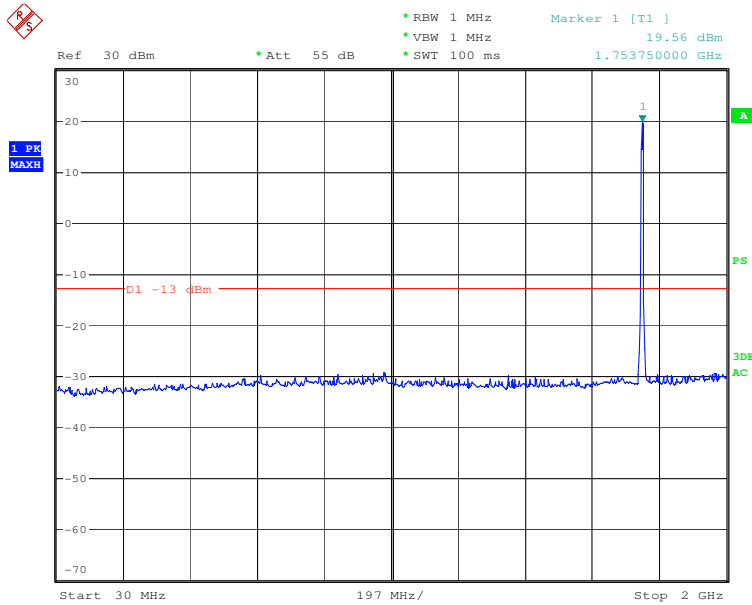
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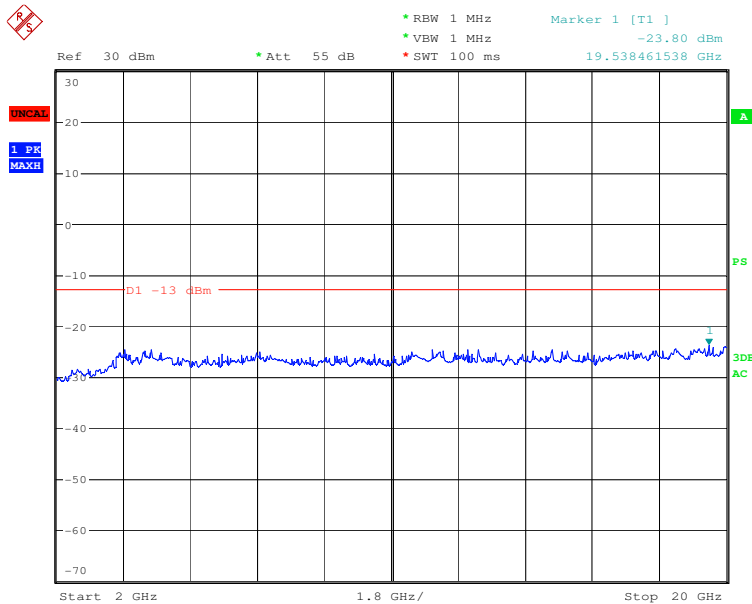
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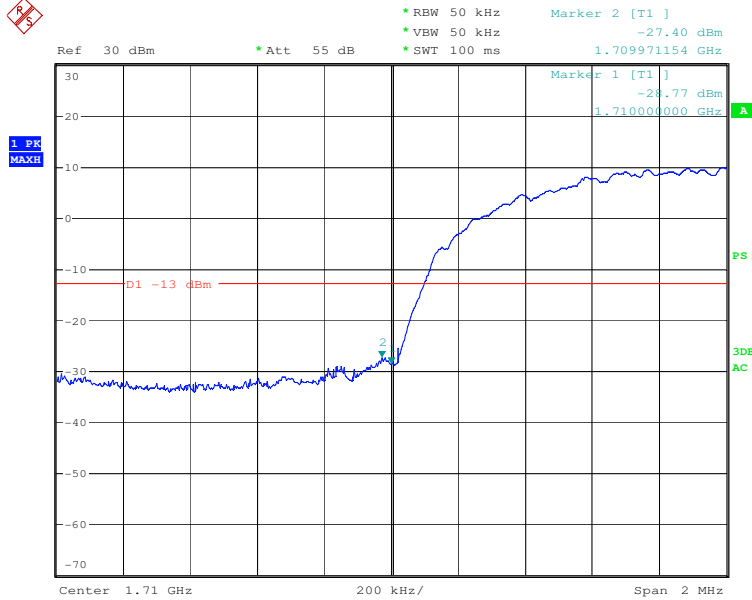
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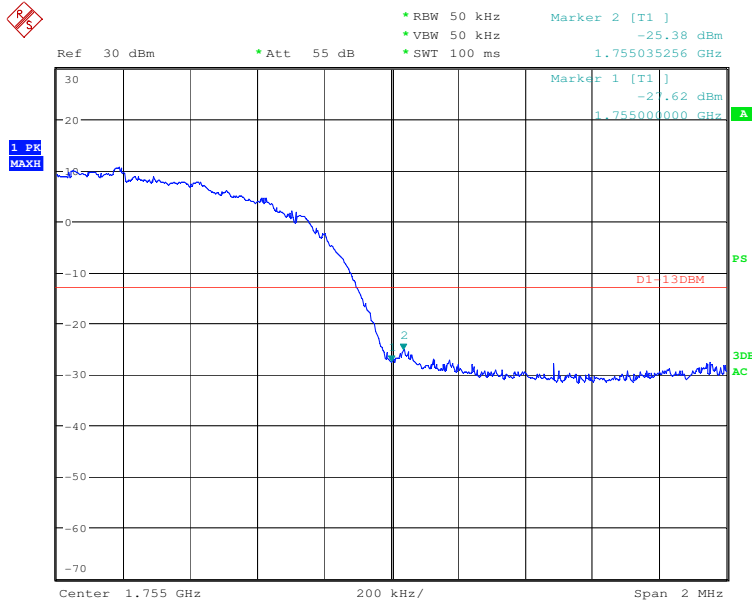


Band Edge emission WCDMA Band IV Channel Low



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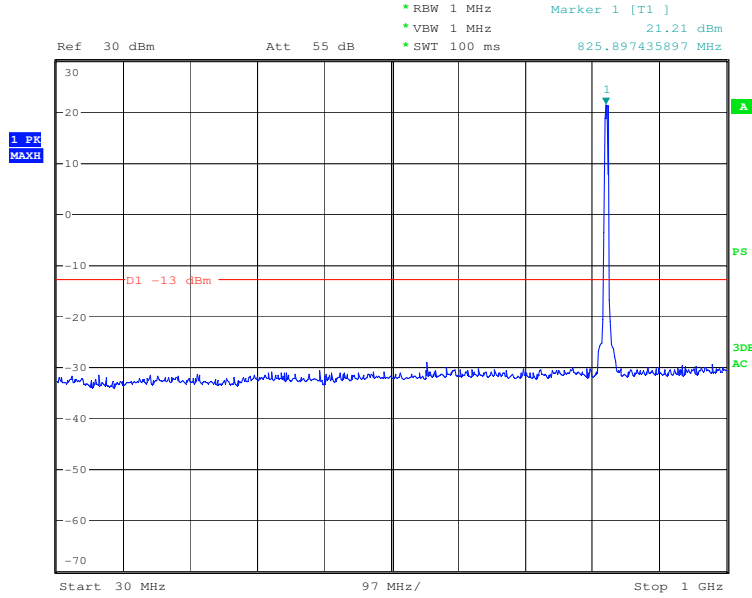
Band Edge emission WCDMA Band IV Channel high



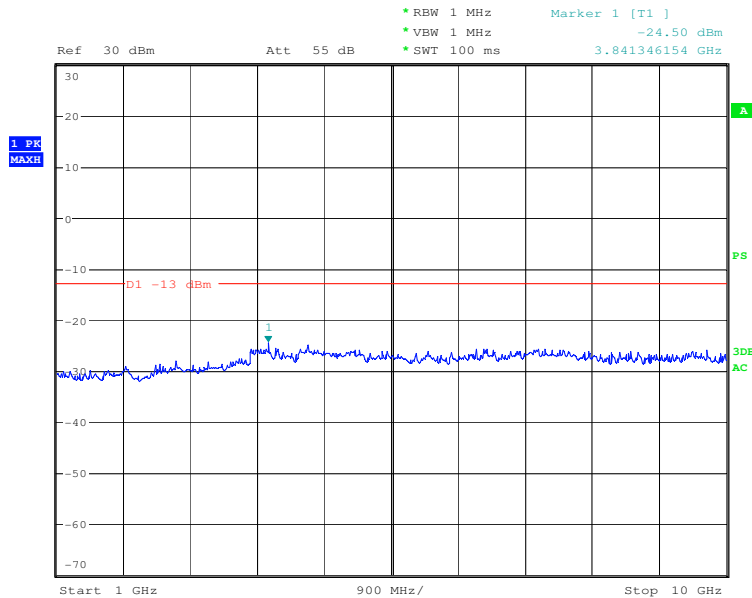
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WCDMA Band V Channel Low



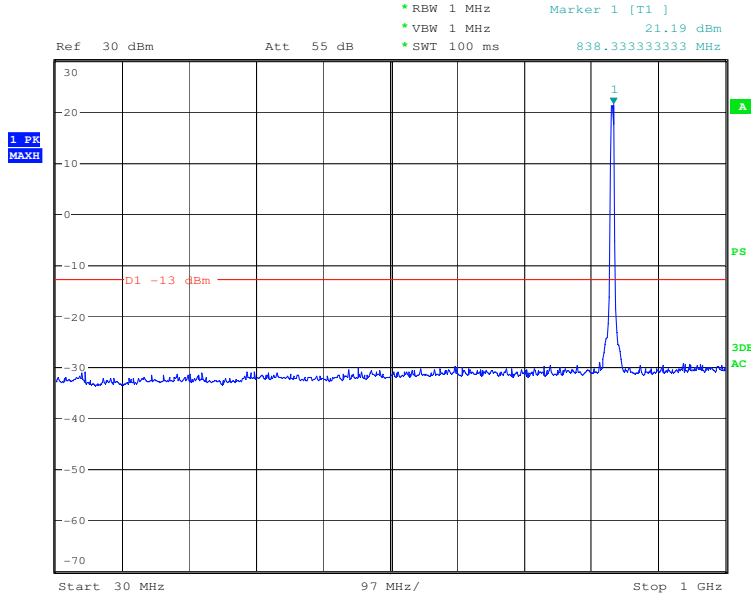
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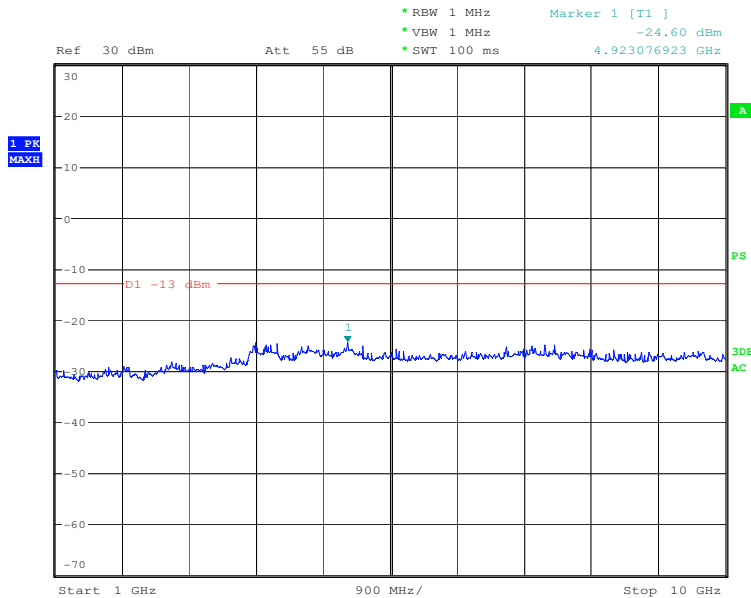
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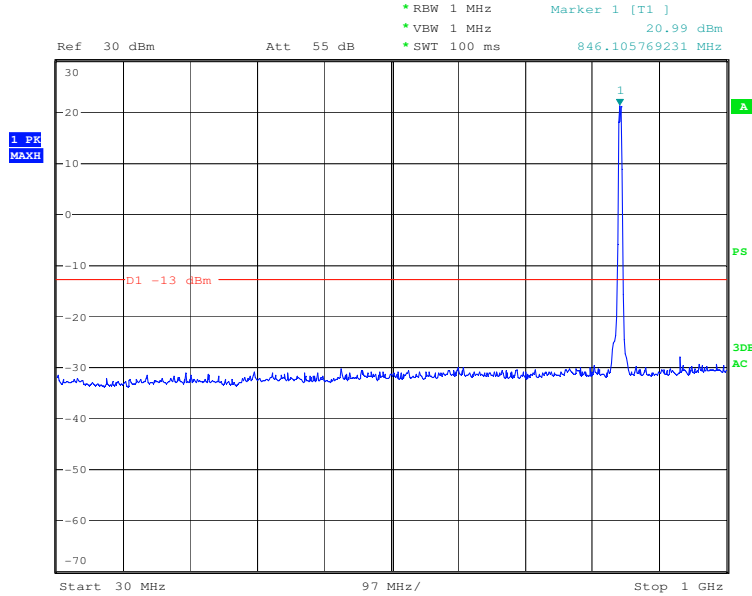
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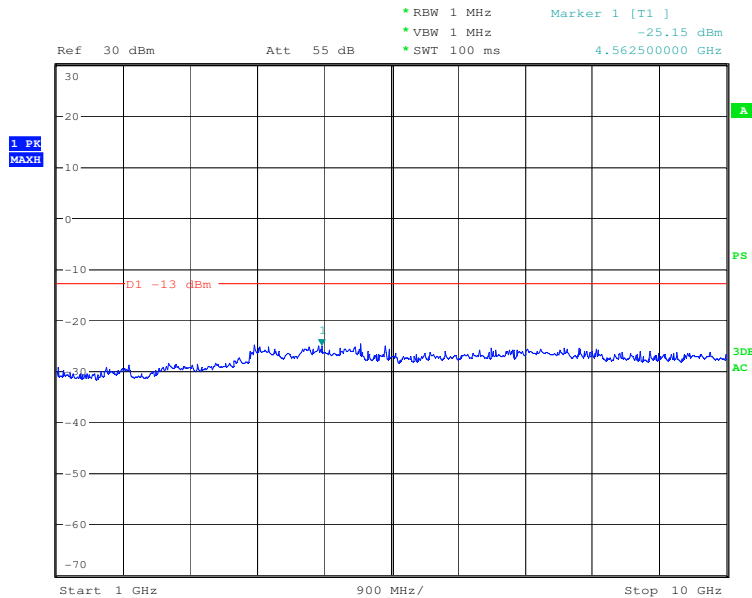
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WCDMA Band V Channel High



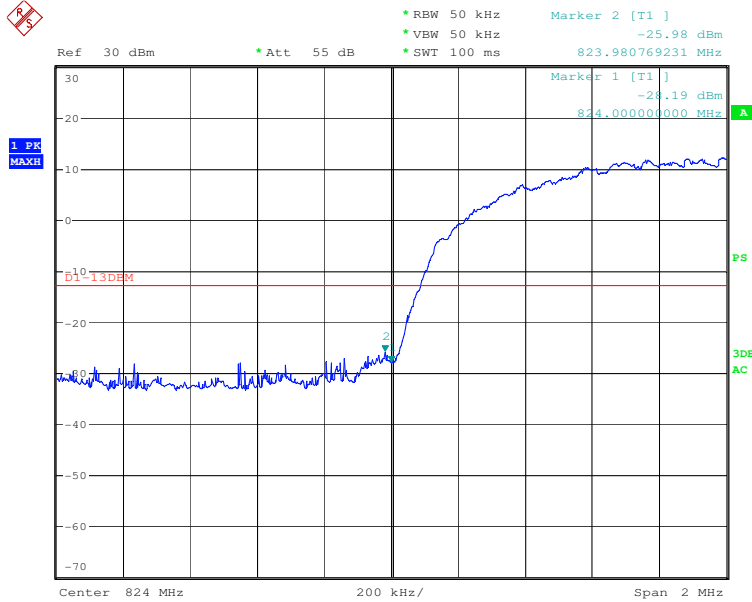
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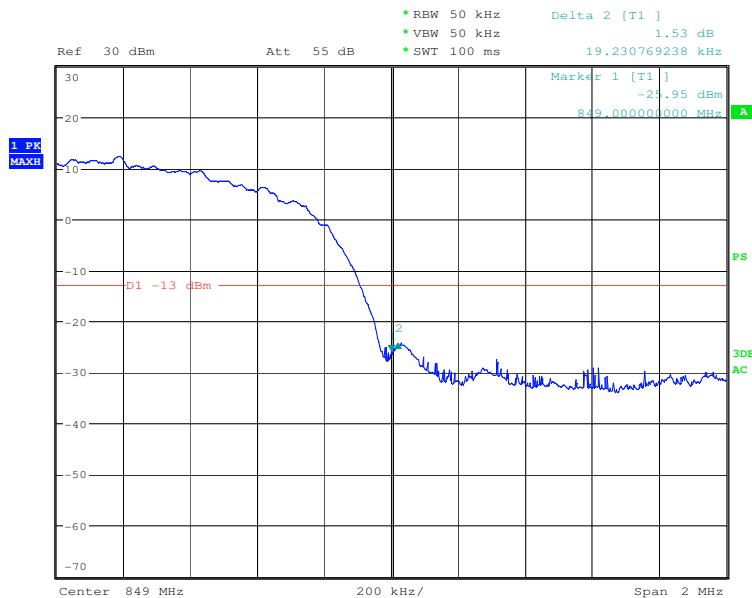


Band Edge emission WCDMA Band V Channel Low



Date: 1.FEB.2011 09:32:50

Band Edge emission WCDMA Band V Channel high



Date: 27.JAN.2011 15:42:49

6.3 Field Strength of Radiated Spurious Emissions

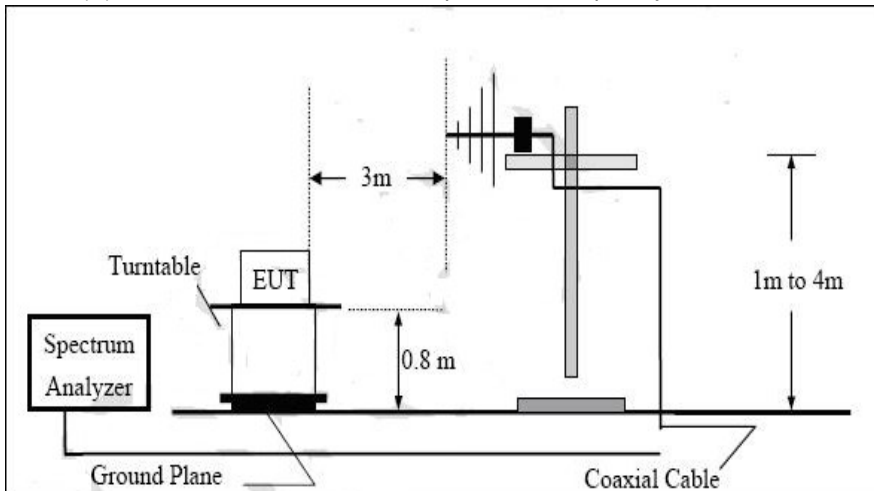
Test Requirement: Part 2.1053

FCC part 22.917(a), 24.238(a), 27.53(g) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specification in the instruction manual and/or alignment procedure, shall not be less than $43+10\log(\text{Mean power in watts})$ dBc below the mean power output outside a license's frequency block(-13dBm).

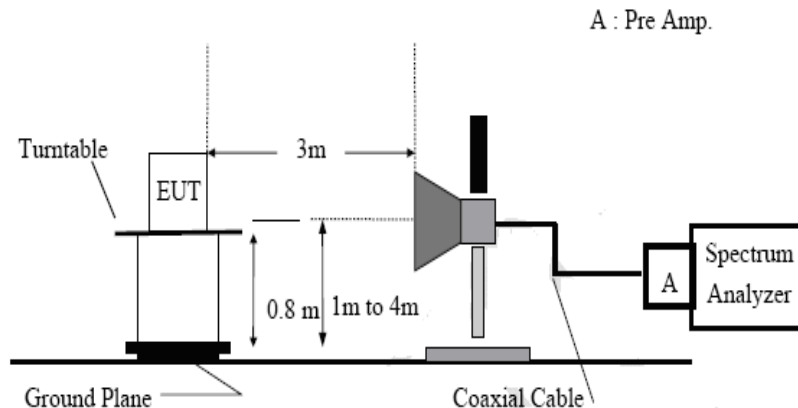
Test Date: Feb. 12 & 18, 2011 & Mar. 4, 2011

Test Setup:

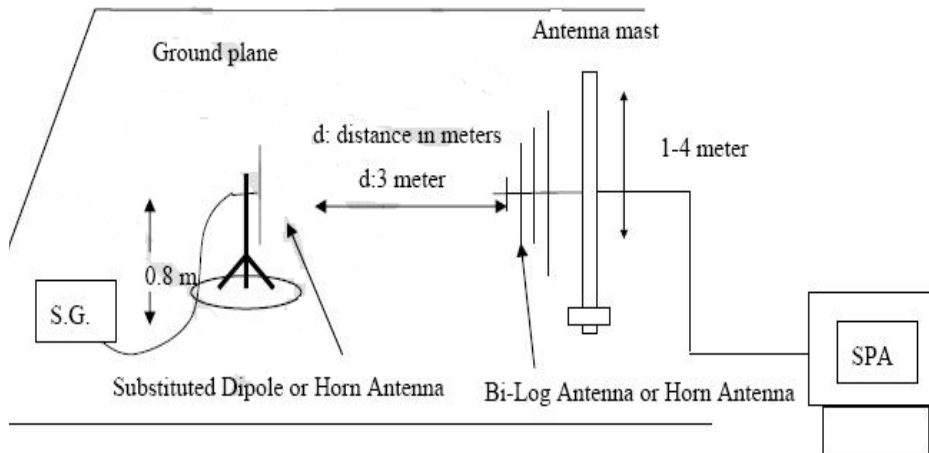
(A) Radiated emission Test setup, Below Frequency 1000MHz:



(B) Radiated emission Test setup frequency over 1GHz:



(C) Substituted Method Test setup:



Test Procedure:

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the measurement, the EUT was in communication with the station. The highest emission was recorded with the rotation of the turntable and lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824.2-848.8MHz were measured using substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1710-1755MHz and 1850.2-1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$



Radiated spurious Emission Measurement Result: GSM 850 mode

Operation mode: TX CH Low mode

Fundamental Frequency: 824.2MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBd) | Cable Loss (dBm) | ERP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|-----------|-------------|------------------|
| 100 | H | -63.47 | 2.6 | 1 | -61.87 | -13 | 48.87 |
| 200 | H | -71.24 | 9.1 | 1.42 | -63.56 | -13 | 50.56 |
| 800 | H | -54.78 | 8.7 | 2.86 | -48.94 | -13 | 35.94 |
| 1648.4 | H | -49.12 | 6.95 | 4.17 | -46.34 | -13 | 33.34 |
| 2472.6 | H | -41.87 | 8.35 | 5.24 | -38.76 | -13 | 25.76 |
| 3296.8 | H | -48.09 | 8.15 | 6.11 | -46.05 | -13 | 33.05 |
| 4121 | H | -47.78 | 8.45 | 6.94 | -46.27 | -13 | 33.27 |
| 100 | V | -60.69 | 2.6 | 1 | -59.09 | -13 | 46.09 |
| 200 | V | -70.04 | 9.1 | 1.42 | -62.36 | -13 | 49.36 |
| 800 | V | -49.99 | 8.7 | 2.86 | -44.15 | -13 | 31.15 |
| 1648.4 | V | -47.56 | 6.95 | 4.17 | -44.78 | -13 | 31.78 |
| 2472.6 | V | -48.23 | 8.35 | 5.24 | -45.12 | -13 | 32.12 |
| 3296.8 | V | -48.11 | 8.15 | 6.11 | -46.07 | -13 | 33.07 |
| 4121 | V | -44.66 | 8.45 | 6.94 | -43.15 | -13 | 30.15 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: GSM 850 mode

Operation mode: TX CH Mid mode

Fundamental Frequency: 836.40MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBd) | Cable Loss (dBm) | ERP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|-----------|-------------|------------------|
| 100.00 | H | -64.05 | 2.6 | 1 | -62.45 | -13 | 49.45 |
| 200.00 | H | -72.72 | 9.1 | 1.42 | -65.04 | -13 | 52.04 |
| 800.00 | H | -53.30 | 8.7 | 2.86 | -47.46 | -13 | 34.46 |
| 1672.80 | H | -47.81 | 6.95 | 4.20 | -45.06 | -13 | 32.06 |
| 2509.20 | H | -42.19 | 8.35 | 5.36 | -39.20 | -13 | 26.20 |
| 3345.60 | H | -46.13 | 8.15 | 6.25 | -44.23 | -13 | 31.23 |
| 4182.00 | H | -48.81 | 8.45 | 6.98 | -47.34 | -13 | 34.34 |
| 100.00 | V | -59.72 | 2.6 | 1 | -58.12 | -13 | 45.12 |
| 200.00 | V | -71.41 | 9.1 | 1.42 | -63.73 | -13 | 50.73 |
| 800.00 | V | -49.40 | 8.70 | 2.86 | -43.56 | -13 | 30.56 |
| 1672.80 | V | -45.77 | 6.95 | 4.20 | -43.02 | -13 | 30.02 |
| 2509.20 | V | -47.64 | 8.35 | 5.36 | -44.65 | -13 | 31.65 |
| 3345.60 | V | -48.47 | 8.15 | 6.25 | -46.57 | -13 | 33.57 |
| 4182.00 | V | -47.85 | 8.45 | 6.98 | -46.38 | -13 | 33.38 |

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

$$\text{ERP (dBm)} = \text{S.G. Output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss}$$

3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: GSM 850 mode

Operation mode: TX CH High mode

Fundamental Frequency: 848.8MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBd) | Cable Loss (dBm) | ERP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|-----------|-------------|------------------|
| 100.00 | H | -64.64 | 2.6 | 1 | -63.04 | -13 | 50.04 |
| 200.00 | H | -72.44 | 9.1 | 1.42 | -64.76 | -13 | 51.76 |
| 800.00 | H | -52.21 | 8.7 | 2.86 | -46.37 | -13 | 33.37 |
| 1697.60 | H | -46.85 | 6.95 | 4.22 | -44.12 | -13 | 31.12 |
| 2546.40 | H | -42.94 | 8.35 | 5.39 | -39.98 | -13 | 26.98 |
| 3395.20 | H | -47.68 | 8.15 | 6.35 | -45.88 | -13 | 32.88 |
| 4244.00 | H | -48.44 | 8.45 | 7.04 | -47.03 | -13 | 34.03 |
| 100.00 | V | -59.72 | 2.6 | 1 | -58.12 | -13 | 45.12 |
| 200.00 | V | -71.41 | 9.1 | 1.42 | -63.73 | -13 | 50.73 |
| 800.00 | V | -49.40 | 8.70 | 2.86 | -43.56 | -13 | 30.56 |
| 1697.60 | V | -45.75 | 6.95 | 4.22 | -43.02 | -13 | 30.02 |
| 2546.40 | V | -47.61 | 8.35 | 5.39 | -44.65 | -13 | 31.65 |
| 3395.20 | V | -48.85 | 8.15 | 6.35 | -47.05 | -13 | 34.05 |
| 4244.00 | V | -46.44 | 8.45 | 7.04 | -45.03 | -13 | 32.03 |

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

$$\text{ERP (dBm)} = \text{S.G. Output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss}$$

3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: PCS 1900 mode

Operation mode: TX CH Low mode

Fundamental Frequency: 1850.2MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi) | Cable Loss (dBm) | EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|------------|-------------|------------------|
| 100.00 | H | -62.38 | 2.6 | 1 | -60.78 | -13 | 47.78 |
| 200.00 | H | -73.66 | 9.1 | 1.42 | -65.98 | -13 | 52.98 |
| 800.00 | H | -72.95 | 8.70 | 2.86 | -67.11 | -13 | 54.11 |
| 1800.00 | H | -50.96 | 7.00 | 4.38 | -48.34 | -13 | 35.34 |
| 3700.40 | H | -49.08 | 8.35 | 6.77 | -47.50 | -13 | 34.50 |
| 5550.60 | H | -38.24 | 9.55 | 8.10 | -37.05 | -13 | 24.05 |
| 7400.80 | H | -43.13 | 9.75 | 9.51 | -42.95 | -13 | 29.95 |
| 9251.00 | H | -41.50 | 10.55 | 11.08 | -42.21 | -13 | 29.21 |
| 100.00 | V | -68.48 | 2.6 | 1 | -66.88 | -13 | 53.88 |
| 200.00 | V | -77.79 | 9.1 | 1.42 | -70.11 | -13 | 57.11 |
| 800.00 | V | -71.56 | 8.70 | 2.86 | -65.72 | -13 | 52.72 |
| 1800.00 | V | -47.18 | 7.00 | 4.38 | -44.56 | -13 | 31.56 |
| 3700.40 | V | -48.49 | 8.35 | 6.77 | -46.91 | -13 | 33.91 |
| 5550.60 | V | -40.05 | 9.55 | 8.10 | -38.86 | -13 | 25.86 |
| 7400.80 | V | -43.23 | 9.75 | 9.51 | -43.05 | -13 | 30.05 |
| 9251.00 | V | -41.26 | 10.55 | 11.08 | -41.97 | -13 | 28.97 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
$$\text{EIRP(dBm)} = \text{S.G. Output(dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss}$$
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: PCS 1900 mode

Operation mode: TX CH mid mode

Fundamental Frequency: 1880.0MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi) | Cable Loss (dBm) | EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|------------|-------------|------------------|
| 100.00 | H | -61.66 | 2.6 | 1 | -60.06 | -13 | 47.06 |
| 200.00 | H | -72.84 | 9.1 | 1.42 | -65.16 | -13 | 52.16 |
| 800.00 | H | -73.16 | 8.70 | 2.86 | -67.32 | -13 | 54.32 |
| 1800.00 | H | -49.83 | 7.00 | 4.38 | -47.21 | -13 | 34.21 |
| 3760.00 | H | -47.69 | 8.42 | 6.84 | -46.11 | -13 | 33.11 |
| 5640.00 | H | -37.92 | 9.50 | 8.31 | -36.73 | -13 | 23.73 |
| 7520.00 | H | -43.05 | 9.78 | 9.6 | -42.87 | -13 | 29.87 |
| 9400.00 | H | -40.74 | 10.61 | 11.32 | -41.45 | -13 | 28.45 |
| 100.00 | V | -67.94 | 2.6 | 1 | -66.34 | -13 | 53.34 |
| 200.00 | V | -78.02 | 9.1 | 1.42 | -70.34 | -13 | 57.34 |
| 800.00 | V | -72.62 | 8.70 | 2.86 | -66.78 | -13 | 53.78 |
| 1800.00 | V | -47.98 | 7.00 | 4.38 | -45.36 | -13 | 32.36 |
| 3760.00 | V | -48.33 | 8.42 | 6.84 | -46.75 | -13 | 33.75 |
| 5640.00 | V | -40.12 | 9.50 | 8.31 | -38.93 | -13 | 25.93 |
| 7520.00 | V | -42.85 | 9.78 | 9.6 | -42.67 | -13 | 29.67 |
| 9400.00 | V | -41.38 | 10.61 | 11.32 | -42.09 | -13 | 29.09 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
$$\text{EIRP(dBm)} = \text{S.G. Output(dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss}$$
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: PCS 1900 mode

Operation mode: TX CH High mode

Fundamental Frequency: 1909.8MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi) | Cable Loss (dBm) | EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|------------|-------------|------------------|
| 100.00 | H | -62.34 | 2.6 | 1 | -60.74 | -13 | 47.74 |
| 200.00 | H | -72.02 | 9.1 | 1.42 | -64.34 | -13 | 51.34 |
| 800.00 | H | -73.73 | 8.70 | 2.86 | -67.89 | -13 | 54.89 |
| 1800.00 | H | -50.44 | 7.00 | 4.38 | -47.82 | -13 | 34.82 |
| 3819.60 | H | -46.71 | 8.42 | 6.88 | -45.13 | -13 | 32.13 |
| 5729.80 | H | -39.84 | 9.50 | 8.48 | -38.39 | -13 | 25.39 |
| 7639.20 | H | -43.40 | 9.78 | 9.70 | -43.16 | -13 | 30.16 |
| 9549.00 | H | -41.00 | 10.61 | 11.64 | -41.53 | -13 | 28.53 |
| 100.00 | V | -67.94 | 2.6 | 1 | -66.34 | -13 | 53.34 |
| 200.00 | V | -78.02 | 9.1 | 1.42 | -70.34 | -13 | 57.34 |
| 800.00 | V | -72.62 | 8.70 | 2.86 | -66.78 | -13 | 53.78 |
| 1800.00 | V | -47.98 | 7.00 | 4.38 | -45.36 | -13 | 32.36 |
| 3819.60 | V | -47.17 | 8.42 | 6.88 | -45.59 | -13 | 32.59 |
| 5729.80 | V | -37.75 | 9.50 | 8.48 | -36.30 | -13 | 23.30 |
| 7639.20 | V | -43.19 | 9.78 | 9.70 | -42.95 | -13 | 29.95 |
| 9549.00 | V | -42.25 | 10.61 | 11.64 | -42.78 | -13 | 29.78 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA Band II mode

Operation mode: TX CH Low mode

Fundamental Frequency: 1852.4MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi) | Cable Loss (dBm) | EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|------------|-------------|------------------|
| 100.00 | H | -67.29 | 2.6 | 1 | -65.69 | -13 | 52.69 |
| 200.00 | H | -82.83 | 9.1 | 1.42 | -75.15 | -13 | 62.15 |
| 800.00 | H | -49.46 | 8.7 | 2.86 | -43.62 | -13 | 30.62 |
| 1800.00 | H | -45.30 | 7 | 4.38 | -42.68 | -13 | 29.68 |
| 3704.80 | H | -53.55 | 8.35 | 6.77 | -51.97 | -13 | 38.97 |
| 5557.20 | H | -51.31 | 9.55 | 8.11 | -49.87 | -13 | 36.87 |
| 7409.60 | H | -47.29 | 9.75 | 9.51 | -47.05 | -13 | 34.05 |
| 9262.00 | H | -45.52 | 10.55 | 11.10 | -46.07 | -13 | 33.07 |
| 100.00 | V | -65.25 | 2.6 | 1 | -63.65 | -13 | 50.65 |
| 200.00 | V | -79.64 | 9.1 | 1.42 | -71.96 | -13 | 58.96 |
| 800.00 | V | -42.99 | 8.7 | 2.86 | -37.15 | -13 | 24.15 |
| 1800.00 | V | -42.98 | 7 | 4.38 | -40.36 | -13 | 27.36 |
| 3704.80 | V | -52.55 | 8.35 | 6.77 | -50.97 | -13 | 37.97 |
| 5557.20 | V | -50.28 | 9.55 | 8.11 | -48.84 | -13 | 35.84 |
| 7409.60 | V | -47.50 | 9.75 | 9.51 | -47.26 | -13 | 34.26 |
| 9262.00 | V | -45.90 | 10.55 | 11.10 | -46.45 | -13 | 33.45 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
$$\text{EIRP(dBm)} = \text{S.G. Output(dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss}$$
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA Band II mode

Operation mode: TX CH mid mode

Fundamental Frequency: 1880.0MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi) | Cable Loss (dBm) | EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|------------|-------------|------------------|
| 100.00 | H | -68.45 | 2.6 | 1 | -66.85 | -13 | 53.85 |
| 200.00 | H | -83.35 | 9.1 | 1.42 | -75.67 | -13 | 62.67 |
| 800.00 | H | -48.37 | 8.7 | 2.86 | -42.53 | -13 | 29.53 |
| 1800.00 | H | -44.18 | 7 | 4.38 | -41.56 | -13 | 28.56 |
| 3760.00 | H | -53.67 | 8.42 | 6.84 | -52.09 | -13 | 39.09 |
| 5640.00 | H | -52.44 | 9.5 | 8.31 | -51.25 | -13 | 38.25 |
| 7520.00 | H | -47.74 | 9.78 | 9.6 | -47.56 | -13 | 34.56 |
| 9400.00 | H | -45.82 | 10.61 | 11.32 | -46.53 | -13 | 33.53 |
| 100.00 | V | -63.97 | 2.6 | 1 | -62.37 | -13 | 49.37 |
| 200.00 | V | -78.71 | 9.1 | 1.42 | -71.03 | -13 | 58.03 |
| 800.00 | V | -40.93 | 8.7 | 2.86 | -35.09 | -13 | 22.09 |
| 1800.00 | V | -42.07 | 7 | 4.38 | -39.45 | -13 | 26.45 |
| 3760.00 | V | -53.66 | 8.42 | 6.84 | -52.08 | -13 | 39.08 |
| 5640.00 | V | -50.74 | 9.5 | 8.31 | -49.55 | -13 | 36.55 |
| 7520.00 | V | -48.07 | 9.78 | 9.6 | -47.89 | -13 | 34.89 |
| 9400.00 | V | -45.47 | 10.61 | 11.32 | -46.18 | -13 | 33.18 |

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

$$\text{EIRP(dBm)} = \text{S.G. Output(dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss}$$

3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA Band II mode

Operation mode: TX CH High mode

Fundamental Frequency: 1907.6MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi) | Cable Loss (dBm) | EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|------------|-------------|------------------|
| 100.00 | H | -67.08 | 2.6 | 1 | -65.48 | -13 | 52.48 |
| 200.00 | H | -81.85 | 9.1 | 1.42 | -74.17 | -13 | 61.17 |
| 800.00 | H | -49.13 | 8.7 | 2.86 | -43.29 | -13 | 30.29 |
| 1800.00 | H | -45.40 | 7 | 4.38 | -42.78 | -13 | 29.78 |
| 3815.20 | H | -54.39 | 8.42 | 6.88 | -52.85 | -13 | 39.85 |
| 5722.80 | H | -51.99 | 9.5 | 8.47 | -50.96 | -13 | 37.96 |
| 7630.40 | H | -47.17 | 9.78 | 9.69 | -47.08 | -13 | 34.08 |
| 9538.00 | H | -45.25 | 10.61 | 11.62 | -46.26 | -13 | 33.26 |
| 100.00 | V | -64.66 | 2.6 | 1 | -63.06 | -13 | 50.06 |
| 200.00 | V | -80.24 | 9.1 | 1.42 | -72.56 | -13 | 59.56 |
| 800.00 | V | -43.29 | 8.7 | 2.86 | -37.45 | -13 | 24.45 |
| 1800.00 | V | -43.88 | 7 | 4.38 | -41.26 | -13 | 28.26 |
| 3815.20 | V | -52.90 | 8.42 | 6.88 | -51.36 | -13 | 38.36 |
| 5722.80 | V | -48.87 | 9.5 | 8.47 | -47.84 | -13 | 34.84 |
| 7630.40 | V | -47.55 | 9.78 | 9.69 | -47.46 | -13 | 34.46 |
| 9538.00 | V | -46.02 | 10.61 | 11.62 | -47.03 | -13 | 34.03 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
$$\text{EIRP(dBm)} = \text{S.G. Output(dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss}$$
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA IV mode

Operation mode: TX CH Low mode

Fundamental Frequency: 1712.4MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi/dBd) | Cable Loss (dBm) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|------------------------|------------------|----------------|-------------|------------------|
| 100.00 | H | -82.05 | 2.6 | 1 | -80.45 | -13 | 67.45 |
| 200.00 | H | -89.35 | 9.1 | 1.42 | -81.67 | -13 | 68.67 |
| 800.00 | H | -62.13 | 8.7 | 2.86 | -56.29 | -13 | 43.29 |
| 1800.00 | H | -44.18 | 7 | 4.38 | -41.56 | -13 | 28.56 |
| 3424.8 | H | -52.66 | 8.25 | 6.52 | -50.93 | -13 | 37.93 |
| 5137.2 | H | -53.68 | 9.26 | 8.01 | -52.43 | -13 | 39.43 |
| 6849.6 | H | -48.16 | 9.95 | 9.25 | -47.46 | -13 | 34.46 |
| 8562.00 | H | -47.52 | 10.35 | 10.51 | -47.68 | -13 | 34.68 |
| 100.00 | V | -83.38 | 2.6 | 1 | -81.78 | -13 | 68.78 |
| 200.00 | V | -89.84 | 9.1 | 1.42 | -82.16 | -13 | 69.16 |
| 800.00 | V | -62.18 | 8.7 | 2.86 | -56.34 | -13 | 43.34 |
| 1800.00 | V | -43.87 | 7 | 4.38 | -41.25 | -13 | 28.25 |
| 3424.8 | V | -52.24 | 8.25 | 6.52 | -50.51 | -13 | 37.51 |
| 5137.2 | V | -53.23 | 9.26 | 8.01 | -51.98 | -13 | 38.98 |
| 6849.6 | V | -48.22 | 9.95 | 9.25 | -47.52 | -13 | 34.52 |
| 8562.00 | V | -47.89 | 10.35 | 10.51 | -48.05 | -13 | 35.05 |

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

$$\text{EIRP(dBm)} = \text{S.G. Output(dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss}$$

3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA IV mode

Operation mode: TX CH Mid mode

Fundamental Frequency: 1732.6MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi/dBd) | Cable Loss (dBm) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|------------------------|------------------|----------------|-------------|------------------|
| 100.00 | H | -82.83 | 2.6 | 1 | -81.23 | -13 | 68.23 |
| 200.00 | H | -90.13 | 9.1 | 1.42 | -82.45 | -13 | 69.45 |
| 800.00 | H | -61.00 | 8.7 | 2.86 | -55.16 | -13 | 42.16 |
| 1800.00 | H | -42.71 | 7 | 4.38 | -40.09 | -13 | 27.09 |
| 3465.2 | H | -50.04 | 8.25 | 6.36 | -48.15 | -13 | 35.15 |
| 5197.8 | H | -52.91 | 9.25 | 7.8 | -51.46 | -13 | 38.46 |
| 6930.4 | H | -46.84 | 9.75 | 9.38 | -46.47 | -13 | 33.47 |
| 8663 | H | -46.90 | 10.41 | 10.75 | -47.24 | -13 | 34.24 |
| 100.00 | V | -82.65 | 2.6 | 1 | -81.05 | -13 | 68.05 |
| 200.00 | V | -90.46 | 9.1 | 1.42 | -82.78 | -13 | 69.78 |
| 800.00 | V | -62.91 | 8.7 | 2.86 | -57.07 | -13 | 44.07 |
| 1800.00 | V | -42.68 | 7 | 4.38 | -40.06 | -13 | 27.06 |
| 3465.2 | V | -47.37 | 8.25 | 6.36 | -45.48 | -13 | 32.48 |
| 5197.8 | V | -52.77 | 9.25 | 7.8 | -51.32 | -13 | 38.32 |
| 6930.4 | V | -46.83 | 9.75 | 9.38 | -46.46 | -13 | 33.46 |
| 8663 | V | -47.67 | 10.41 | 10.75 | -48.01 | -13 | 35.01 |

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

$$EIRP(dBm) = S.G. Output(dBm) + Antenna Gain(dBi) - Cable Loss$$

3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA IV mode

Operation mode: TX CH High mode

Fundamental Frequency: 1752.6MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBi/dBd) | Cable Loss (dBm) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|------------------------|------------------|----------------|-------------|------------------|
| 100.00 | H | -82.58 | 2.6 | 1 | -80.98 | -13 | 67.98 |
| 200.00 | H | -89.05 | 9.1 | 1.42 | -81.37 | -13 | 68.37 |
| 800.00 | H | -62.16 | 8.7 | 2.86 | -56.32 | -13 | 43.32 |
| 1800.00 | H | -44.18 | 7 | 4.38 | -41.56 | -13 | 28.56 |
| 3505.2 | H | -53.85 | 8.25 | 6.32 | -51.92 | -13 | 38.92 |
| 5257.8 | H | -50.28 | 9.35 | 7.81 | -48.74 | -13 | 35.74 |
| 7010.4 | H | -48.30 | 9.75 | 9.06 | -47.61 | -13 | 34.61 |
| 8763 | H | -46.29 | 10.45 | 10.41 | -46.25 | -13 | 33.25 |
| 100.00 | V | -83.27 | 2.6 | 1 | -81.67 | -13 | 68.67 |
| 200.00 | V | -88.17 | 9.1 | 1.42 | -80.49 | -13 | 67.49 |
| 800.00 | V | -62.60 | 8.7 | 2.86 | -56.76 | -13 | 43.76 |
| 1800.00 | V | -44.09 | 7 | 4.38 | -41.47 | -13 | 28.47 |
| 3505.2 | V | -48.54 | 8.25 | 6.32 | -46.61 | -13 | 33.61 |
| 5257.8 | V | -51.52 | 9.35 | 7.81 | -49.98 | -13 | 36.98 |
| 7010.4 | V | -49.15 | 9.75 | 9.06 | -48.46 | -13 | 35.46 |
| 8763 | V | -47.52 | 10.45 | 10.41 | -47.48 | -13 | 34.48 |

Remark:

- 1 emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:

$$\text{EIRP(dBm)} = \text{S.G. Output(dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss}$$
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA Band V mode

Operation mode: TX CH Low mode

Fundamental Frequency: 826.4MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBd) | Cable Loss (dBm) | ERP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|-----------|-------------|------------------|
| 100 | H | -81.13 | 2.6 | 1 | -79.53 | -13 | 66.53 |
| 200 | H | -91.42 | 9.1 | 1.42 | -83.74 | -13 | 70.74 |
| 800 | H | -60.03 | 8.7 | 2.86 | -54.19 | -13 | 41.19 |
| 1652.8 | H | -52.12 | 6.95 | 4.17 | -49.34 | -13 | 36.34 |
| 2479.2 | H | -48.19 | 8.35 | 5.26 | -45.10 | -13 | 32.10 |
| 3305.6 | H | -55.77 | 8.15 | 6.14 | -53.76 | -13 | 40.76 |
| 4132 | H | -55.53 | 8.45 | 6.95 | -54.03 | -13 | 41.03 |
| 100 | V | -75.46 | 2.6 | 1 | -73.86 | -13 | 60.86 |
| 200 | V | -90.52 | 9.1 | 1.42 | -82.84 | -13 | 69.84 |
| 800 | V | -64.15 | 8.7 | 2.86 | -58.31 | -13 | 45.31 |
| 1652.8 | V | -52.9 | 6.95 | 4.17 | -50.12 | -13 | 37.12 |
| 2479.2 | V | -49.53 | 8.35 | 5.26 | -46.44 | -13 | 33.44 |
| 3305.6 | V | -55.46 | 8.15 | 6.14 | -53.45 | -13 | 40.45 |
| 4132 | V | -55.44 | 8.45 | 6.95 | -53.94 | -13 | 40.94 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA Band V mode

Operation mode: TX CH Mid mode

Fundamental Frequency: 836.6MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBd) | Cable Loss (dBm) | ERP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|-----------|-------------|------------------|
| 100 | H | -80.92 | 2.6 | 1 | -79.32 | -13 | 66.32 |
| 200 | H | -90.06 | 9.1 | 1.42 | -82.38 | -13 | 69.38 |
| 800 | H | -61.63 | 8.7 | 2.86 | -55.79 | -13 | 42.79 |
| 1673.2 | H | -50.09 | 6.95 | 4.2 | -47.34 | -13 | 34.34 |
| 2509.8 | H | -48.3 | 8.35 | 5.36 | -45.31 | -13 | 32.31 |
| 3346.4 | H | -55.65 | 8.15 | 6.25 | -53.75 | -13 | 40.75 |
| 4183 | H | -54.45 | 8.45 | 6.98 | -52.98 | -13 | 39.98 |
| 100 | V | -75.95 | 2.6 | 1 | -74.35 | -13 | 61.35 |
| 200 | V | -90.61 | 9.1 | 1.42 | -82.93 | -13 | 69.93 |
| 800 | V | -62.77 | 8.7 | 2.86 | -56.93 | -13 | 43.93 |
| 1673.2 | V | -49.4 | 6.95 | 4.2 | -46.65 | -13 | 33.65 |
| 2509.8 | V | -47.2 | 8.35 | 5.36 | -44.21 | -13 | 31.21 |
| 3346.4 | V | -55.57 | 8.15 | 6.25 | -53.67 | -13 | 40.67 |
| 4183 | V | -54.36 | 8.45 | 6.98 | -52.89 | -13 | 39.89 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss
- 3 The emission level of 6th to 10th harmonic is too low to be measured.



Radiated spurious Emission Measurement Result: WCDMA Band V mode

Operation mode: TX CH High mode

Fundamental Frequency: 846.6MHz

| Frequency (MHz) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dBd) | Cable Loss (dBm) | ERP (dBm) | Limit (dBm) | Safe Margin (dB) |
|-----------------|--------------|------------------|--------------------|------------------|-----------|-------------|------------------|
| 100 | H | -74.86 | 2.6 | 1 | -73.26 | -13 | 60.26 |
| 200 | H | -90.49 | 9.1 | 1.42 | -82.81 | -13 | 69.81 |
| 800 | H | -63.88 | 8.7 | 2.86 | -58.04 | -13 | 45.04 |
| 1693.2 | H | -52.99 | 6.95 | 4.22 | -50.26 | -13 | 37.26 |
| 2539.8 | H | -49.84 | 8.35 | 5.38 | -46.87 | -13 | 33.87 |
| 3386.4 | H | -54.58 | 8.15 | 6.33 | -52.76 | -13 | 39.76 |
| 4233 | H | -53.76 | 8.45 | 7.03 | -52.34 | -13 | 39.34 |
| 100 | V | -74.77 | 2.6 | 1 | -73.17 | -13 | 60.17 |
| 200 | V | -89.59 | 9.1 | 1.42 | -81.91 | -13 | 68.91 |
| 800 | V | -64.21 | 8.7 | 2.86 | -58.37 | -13 | 45.37 |
| 1693.2 | V | -49.96 | 6.95 | 4.22 | -47.23 | -13 | 34.23 |
| 2539.8 | V | -49.01 | 8.35 | 5.38 | -46.04 | -13 | 33.04 |
| 3386.4 | V | -55.16 | 8.15 | 6.33 | -53.34 | -13 | 40.34 |
| 4233 | V | -53.91 | 8.45 | 7.03 | -52.49 | -13 | 39.49 |

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 The result basic equation calculation is as follow:
ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss
- 3 The emission level of 6th to 10th harmonic is too low to be measured.

~End of Report~